For example, \Q1 selects QRSS3 or 3-second dits, and \Q4 selects 60-second dits.

Although it's possible to send QRSS directly from the keyboard by entering a command before a string, the most efficient use of QRSS is to format a specific QRSS message.

RTTY

The K45 can be configured to operate in RTTY transmit mode. Receive RTTY is not included. The format is fixed to Baudot FSK with many options. Two menus of choices are provided by a keyboard command (**ESC-R**). Message storage and editing are also used, as with straight CW. Most common RTTY functions — reverse, diddling, and CR/LF handling — can be selected.

The K45 provides FSK output, which directly drives a transceiver's FSK input — assuming the transceiver has this capability. When RTTY is first enabled, transmitter FSK output is assigned to the ring of the output jack, while transmitter key output is assigned to the tip. These can be changed by command.

In Summary

There is a large set of capabilities in the K45 that you can select, modify, use, or not use. It is adaptable to just about every sort of CW operation because it does not need a PC. Generally, any sort of USB supply will power it to full ability.

During this test, the unit added quite a bit of interest and fun to my CW operating. It was interesting to see the letters and words appear on the LCD screen as I compared them with the ones I copied in my head. I am not a very good typist; when I got tired of using the keyboard, I moved my right hand over to my Bencher paddles and I was back in familiar territory. Brief stored messages were nothing new here, but the mapped letter capability was a nice feature.

Manufacturer: K1EL Systems LLC, made in the USA. **https://hamcrafters2.com**. Price: $239.

Buddipole BuddiHEX Portable Hexagonal Beam Antenna

Reviewed by John Leonardelli, VE3IPS
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When I was a teenager, I made my first DX contact from a local schoolyard using a Citizens Band (CB) walkie-talkie. It was then that my fascination with ham radio started. Once I obtained my amateur radio license, I got much satisfaction from operating from parks or out in the field using battery power and portable antennas to recreate the thrill of my first DX contact. Over the years, my Buddipole and Buddistick antennas served me well, but it became time to add a Yagi antenna to my deployment kit.

My first thought was to use a three-element Yagi, but the weight and the inability to transport it in an easy manner had me looking at alternate antennas. Also, the Yagi would cover only three bands, and I wanted a solution

Bottom Line

The BuddiHEX bundle is a complete and easily transportable antenna system that provided me the opportunity to make better contacts, farther, and with less noise.

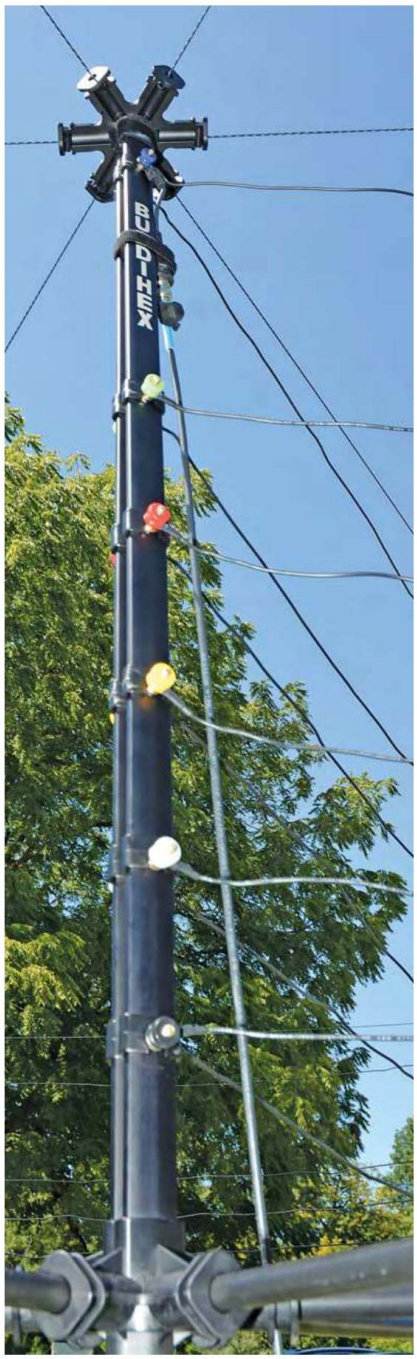

Figure 5 — Vertical feed point (VFP) hub.

Figure 6 — BuddiHEX unboxed.

Figure 7 — Mastwerks mast unboxed.

for 17 and 6 meters. It was around this time that Chris Drummond, W6HFP, started talking about the BuddiHEX antenna and had several prototypes being field-tested. I knew instantly that I needed to get one to use in my portable operations.

Description

The BuddiHEX antenna offers a **W**-shaped driven element with a **U**-shaped parasitic reflector in a two-element format. This is like some other hexagonal (HEX) beam antenna designs. Research shows that these antennas offer approximately 8 dB forward gain at 30-feet elevation and approximately 15 – 20 dB front-to-back ratio. These figures provide meaningful improvements on reception and transmission over basic dipoles. The HEX-style beams use a center vertical feed-point (VFP) hub (see Figure 5) for element termination, six spreader arms, and tension cables. My portable operation needs a fast deployment, lightweight and easy transport, and rugged construction.

My requirements for a portable beam antenna are met with the BuddiHEX beam. The assembled weight of 10 pounds (4.54 kg) and an 11-foot turning radius make it easy for a single person to deploy. I also needed a mast to get the antenna up high (for better results) and a way to carry everything easily and not lose parts along the way. The BuddiHEX makes for a complete and easily transportable antenna system.

This antenna is also perfect for ARRL Field Day operations, as it can handle the full-power legal limit of 1.5 kW.

BuddiHEX Bundle

This year, I attended Hamvention® with the sole purpose of picking up this antenna. At the show, Buddipole was offering only a bundle that included the BuddiHEX,

Table 1 — Buddipole BuddiHEX (HX6) Portable Hexagonal Beam Antenna
Manufacturer advertised specifications (not tested by the ARRL lab)
Frequency coverage: 6 to 20 meters
(V)SWR: <1.5:1 at band center
Maximum power rating: 1500 W
Connector: BNC (optional PL-259)
Antenna weight: 10 pounds (4.54 kilograms)
Turning radius: 11 feet (3.35 meters)
Gain: 8 dB (30-feet elevation above ground)
Antenna type: Hexagonal beam antenna
Dimension: Not specified
Wind load area: 4 square feet

the 7m Mastwerks Tripod and Mast System, and a Sportube transport case (see Figures 6, 7, and 8). The BuddiHEX is a lightweight and portable six-band HEX beam antenna that is perfect for POTA activations, camping trips, Field Day, or operating from other automobile-accessible locations. The antenna package comes complete with a padded carry bag with high-quality YKK zippers, pre-tuned wire elements, line winders, a VFP hub, six spreader arms, a BNC terminated feed point, and a manual with visual diagrams for each step. The antenna offers six bands, including 20, 17, 15, 12, 10, and 6 meters. The 6-meter band addition is important to me, because I do a lot of operations in the magic band. Unfortunately, it doesn't provide coverage for 40 meters. However, this was a brilliant bundle, as I was able to deploy the antenna in the parking lot of the local motel in which we were staying.

7m Mastwerks Tripod and Mast System

I already have the 8- and 18-foot Buddipole masts, but I wanted something that would allow me to rotate the antenna. The bundle included the Mastwerks tripod and mast system. This is a lightweight and portable tripod and rotational quick-deployment mast. The tripod has rubber feet and adjustable leg lengths. It is rugged and uses customized injection-molded parts with the same kind of nylon plastic used in the Buddipole antenna, but it also has customized aluminum tubing. This plastic is fiberglass-reinforced (filled) nylon providing strength to the components. The mast is oval shaped, which prevents it from twisting. The advantage of this system is that it weighs only 14.8 pounds for the 23-foot model, which collapses down to 4 feet. It fits into the Sportube or in its carry bag. It also has a hand crank, which is unique, because it allows rotation of the mast. A built-in bubble level ensures a proper setup. Included in the high-quality carry bag is an upper and lower guyline kit with its own line winders. The VFP hub mounts on the mast without any adapter, but the Buddipole mounts on the mast with an adapter that uses the standard 0.5-inch national pipe thread (NPT). If you want to mount any other type of antenna on it, like an Arrow Yagi, you need to make an adapter. I look forward to using the mast with an Arrow Yagi for VHF/UHF contesting.

Sportube Series 2 Transport Case

The BuddiHEX bundle also comes with the Sportube (see Figure 8), which is perfect for holding the antenna bag and the tripod bag. The antenna comes in a hard-shell case that protects the equipment when traveling. This case weighs 12 pounds, and the roller wheels make transport easy.

The whole antenna system weighs 37 pounds. This is within the 50-pound limit most airlines have for checked luggage.

Field Report

My first deployment of the antenna — using the instruction manual in one hand, and putting the antenna together with the other hand (no tools required) — was straightforward and took an hour. The Buddipole team provides pre-tuned wires, and no measurement or cutting is required. I've done this several times, and I can put up the antenna by myself within 20 to 30 minutes.

The first step is to deploy the tripod. After making it level, I add the upper and lower guy rings and ropes to the mast. I then push up each telescopic mast element with the upper and lower guy wires loosely in place. Then, I tighten the guys for the appropriate height. That way, when I build the BuddiHEX, I can push it up and everything is in place. Buddipole recommends two people to do this, but it can be done alone with some patience. Each of the six spreader arms is unfolded, placed on the ground, and inserted into the lower section of the VFP hub, which is facing upwards. The next step is deploying the perimeter tension cords by inserting the toggle into the next arm insertion point. Then, insert the remaining tension cords into the peripheral ends of the hub. After adding the tension cords, you have what looks like an upside-down umbrella laying on the ground.

Figure 8 — Sportube case.

The wire elements are color coded and pre-tuned, and they are stored on the included line winders. The color-coded marks on the arms help to simplify the wire element installation. The 20-meter band connects the end wire to the top of the VFP hub. Clip it onto the spreader using the same color-coded clips (facing upward), and walk around until the other connection is made. The antenna element-binding points are hand-tightened. Do this for the other five bands. Attach the BNC feed point to the top banana jacks on the VFP, and add your coax assembly. I use the Buddipole coax, as it comes with end covers, uses military-grade coax, and is easy to coil and uncoil. The final step is to install a special tensioning cord to the driven element area at the front of the director section to maintain the hexagonal shape and to keep it tight.

I lift the antenna assembly off the ground, holding the VFP hub in one hand and an element in the other, and place it onto the Mastwerks mast. The two components fit together perfectly. Now I can push the mast up to its operating height, and the preloaded guy wires are in place. I connect the coax to my radio and check my SWR, and I'm now on the air. I did an SWR sweep for all of the bands and found the SWR for all of them to be under 1.5 (see Figures A – F). There is enough bandwidth that an antenna tuner is not required. Everything works as designed out of the box. On my first deployment, I used no tools or measuring tape and was transmitting an hour later.

During a POTA activation at Mary Lake, VE-5549, I was working a pileup into the southern US on 20 meters with the antenna pointed south. I used the Yaesu FT-891 transceiver and Bioenno LiFePO4 12 V 12 Ah battery. Mike, CU3HY, in Azores, Portugal, called me and was coming in 5 by 5. I rotated the beam toward Europe using the hand crank. I then had a 5 by 8 signal report that allowed a 20-minute QSO to discuss a future trip to the islands for a SOTA activation. The BuddiHEX proved itself with improved signal reports both ways. I found that the antenna provided several S-units of improvement over my vertical dipole antenna on transmit and receive. The front-to-back ratio was also useful, with as much as five S-units. This allowed me to work Europeans while reducing the US signals behind me, causing less interference. On-air tests also provided similar results, with the BuddiHEX performing admirably.

This antenna has also allowed me to null out noise sources on 6 meters and work a weak KP4 station that was not possible with my Buddistick antenna as I did an A/B antenna check.

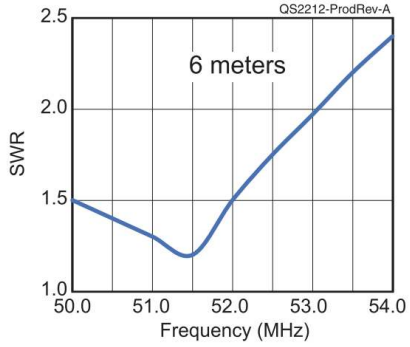

Figure A — 6-meter SWR sweep.

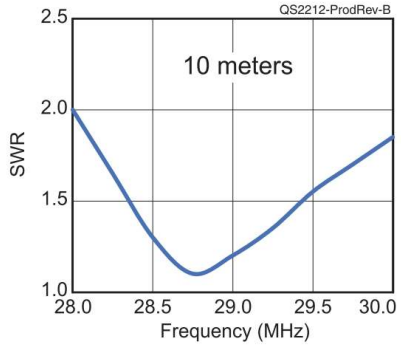

Figure B — 10-meter SWR sweep.

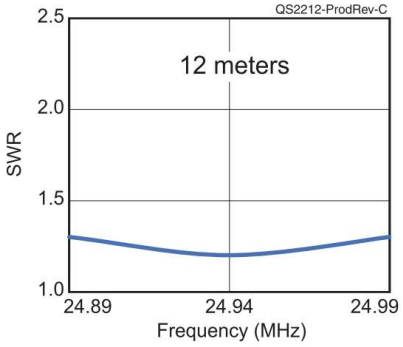

Figure C — 12-meter SWR sweep.

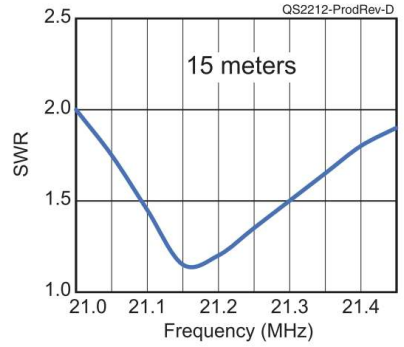

Figure D — 15-meter SWR sweep.

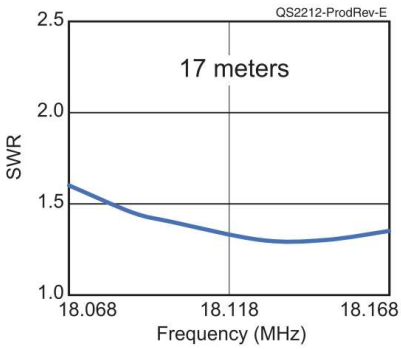

Figure E — 17-meter SWR sweep.

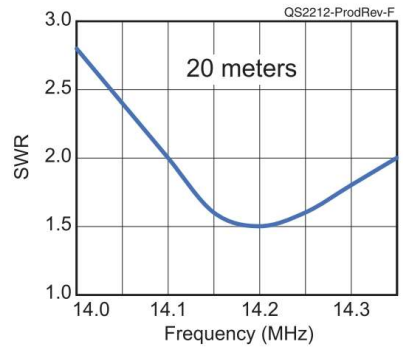

Figure F — 20-meter SWR sweep.

BuddiHEX Hacks

One modification I made immediately was to use some plumbing bits to make a mast adapter, which allowed me to use an Arrow antenna on top of the Mastwerks mast. This plumbing fitting has the same NPTs as the Buddipole (see Figure 9).

Figure 9 — Mast adapter.

The 40/20-meter antenna is an inverted **V**-linked dipole using a PackTenna Mini balun with switches to add or remove the 40-meter legs as needed. I use a small Nite Ize carabiner clip to attach the balun to the upper guy ring. So now I can cover 40 – 6 meters with two antennas on one mast, deployed in less than 30 minutes, with no tools and no tuning required.

I am also looking at adding a dual-band VHF/UHF antenna on the top of the VFP hub, which could allow me coverage of those bands as well.

The BuddiHEX bundle does everything I expected. It performs well on all bands, doesn't require an antenna tuner, and can quickly and easily be deployed by a single person. If you are looking to add a directional antenna to your portable go-box, the BuddiHEX may be the right choice for you.

Conclusion

The BuddiHEX provided me the opportunity to make better contacts, farther, with less noise. The system is an investment, and the build quality is excellent. I see many years of usage. This antenna can be left outdoors in a permanent type of installation, but this may not be designed for harsh winters and rain-soaked environments.

Manufacturer: Buddipole, Inc. 3028 SE 59th Ct. #600, Hillsboro, OR 97123. **www.buddipole.com**. Price: $599; 7m Mastwerks Tripod and Mast System, $659; Sportube Series 2 transport case, $249.

WA3RNC TR-35 40/30/20/17-Meter CW Transceiver Kit

Reviewed by Mark Wilson, K1RO
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Building on the TR-25 40/20-meter CW transceiver kit reviewed in the December 2021 issue of *QST*, the TR-35 from John Dillon, WA3RNC, adds coverage of 30 and 17 meters, along with narrow/wide CW filter choices and SSB reception. The transceiver is available as a kit or assembled and tested. We ordered the kit version for this review.

Like the TR-25, the TR-35 was designed with portable operation in mind. It's compact and lightweight, and all functions are controlled by front-panel switches and knobs (no menus). The radio requires 9.5 – 14 V dc and still produces 4 – 5 W RF output at the low end of that range. Maximum power output is 8 – 10 W with a 14 V dc power source. The transceiver draws about 100 mA on receive and 1 A on transmit, so a modest 12 V battery will power your operation for several hours.

Although you can use any suitable battery or power supply, the WA3RNC website (**www.wa3rnc.com**) indicates that the TR-35 is optimized for operation from

Bottom Line

The WA3RNC TR-35 40/30/20/17-meter CW transceiver kit is well thought out and packaged, making it an attractive project for anyone who has learned the basics of soldering and PC board construction. The radio works well and is easy to use, and it is especially suited to portable operation where size, weight, and power requirements matter.